

## AMENDMENTS TO THE SPECIFICATION

- Please replace Title with the following replacement Title on page 1

**ARTIFICIAL INTELLIGENCE BASED MANUFACTURING MONITORING SYSTEMS AND**  
**METHOD PRODUCTION PATTERN RECOGNITION ARTIFICIAL NEURAL NET (ANN)**  
**WITH EVENT RESPONSE EXPERT SYSTEM (ES) YIELDSHIELD™**

- Please replace paragraph [0012] with the following amended paragraph:

**[0012]** Figure 1 is illustrative of a simple artificial neural network (ANN). Signals  $X_1$  to  $X_n$  are inputs of an artificial neuron and  $Y$  is an output signal. The values of the input signals  $X_1$  to  $X_n$  may be constantly changing (analogous) or binary quantities, and the output signal  $Y$  may usually be given both positive and negative values.  $W_1$  to  $W_n$  are weighting coefficients, i.e. synaptic strengths or weights, which may also be either positive or negative. In some cases, only positive signal values and/or weighting coefficients are used. Synapses  $11_1$  to  $11_n$  of the neuron weight the corresponding input signal by weighting coefficients  $W_1$  to  $W_n$ . A summing circuit 12 calculates a weighted sum  $U$ . The sum  $U$  is supplied to a thresholding function circuit 13, whose output signal is  $V$ . The threshold function may vary, but usually a sigmoid or a piecewise linear function is used, whereby the output signal is given continuous values. In a conventional neuron, the output signal  $V$  of the thresholding function circuit 13 is simultaneously the output signal  $Y$  of the whole neuron.

- Please replace paragraph [0029] with the following amended paragraph:

**[0029]** Figure 4 is a first time pass report that shows 10 testers on a tester line testing a user interface.

- Please replace paragraph [0034] with the following amended paragraph:

**[0034]** A visual inspection input into the ANN system may include an optical inspection system Figure 2. Figure 2 is an example of the preferred embodiment of the invention used in the environment of a DUT as described. Figure 2 is an example only. Optical inspection system comprises an optical image capture device 260, IR fiducial sensor 230, IR fiducial emitter 220. Optical image capture device 260 may be camera, Charge Coupled Device

(CCD) or the like. Optical image capture device 260 may be moveable to allow for inspection control. Optical image capture device 260 may also be fixed and images DUT as it travels below said optical image capture device ~~260~~<sup>260640</sup>. The optical image capture device is activated when DUT on fixture passes pass a trigger line 240. There may also be ready line 250 wherein DUT and fixture pauses until the inspection area is ready to receive a new electronic device which is to be tested.

- Please replace paragraph [0045] with the following amended paragraph:

**[0045]** At this point in the example, a human must try to discern what is the variance between all the different testers and why one is nearly 4% less productive ~~(goal across NMP is 97% at this stage)~~. Time ranges (across the top) from 0400 hours to 1500 hours with no production after 1400 hours. This means that the line has for some reason stopped for over an hour in the example.

- Please replace paragraph [0048] with the following amended paragraph:

**[0048]** A human must frequently study the monitor, try to discern patterns after they have begun to emerge, and correctly respond – a skill which varies widely from person to person, and from different hours of the day. An inexperienced person at 0230 hours on Saturday morning may miss a problem, and that problem may remain untreated until 0600 hours on Monday morning after thousands of aberrant handsets have been manufactured.

- Please replace paragraph [0051] with the following amended paragraph:

**[0051]** Also, notice Test Step ID number 215 – TXA PL2 (Power Level 2) nearly across the board but low level.

- Please replace paragraph [0053] with the following amended paragraph:

**[0053]** Figure 6 is a bar graph which appears to the untrained as an indicator of good production because green means good. Actually it can be set to turn red on any threshold, and were this stage set to the stated 97% yield only 0400 hours and 1200 hours would be green.